

REMARKS*Brief Status of the Application*

In the Office Action, claims 1-8 were rejected. In the present Amendment, claims 2 and 5-8 have been cancelled, claims 1, 3, and 4 have been amended, and claims 9 and 10 have been newly added. The amendment of claims 1, 3, and 4 and addition of claims 9 and 10 are supported by the specification and, thus, no new matter is added. Claims 1, 3, 4, 9, and 10 remain under consideration. Claims 1, 4, and 9 are independent claims.

Rejection Under 35 U.S.C. § 112, second paragraph

Claim 1-3 and 5-8 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Claims 2 and 5-8 have been cancelled. Thus, the rejections directed to claims 2 and 5-8 are moot. Claims 1 and 3 have been amended to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Accordingly, applicants respectfully request withdrawal of the rejection.

Rejections Under 35 U.S.C. §§ 102(b) and 103(a)

Claims 1-3 and 5-7 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over either (1) the Cheng et al. reference, (2) the Penrod reference or (3) the Higby et al. reference. Claims 1-3 and 5-7 were also rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over either (1) the Boulos et al. reference, (2) EP 823,404 or (3) the Amrhein et al. reference. The Examiner alleges that each of these references teaches a soda-lime glass batch comprising Na_2SO_4 and an additive which is within the scope of the claimed additives. The examiner further alleges that, in the alternative, no distinction is seen to exist between these

references and the claimed invention in the absence of any evidence showing the contrary.

Claims 4 and 8 were rejected under 35 U.S.C. § 103(a) as unpatentable over the Amrhein et al. reference. The Examiner states that the Amrhein et al. reference teaches that a portion of Na_2SO_4 in the soda-lime glass batch is replaced with a nitrate because this replacement suppresses sulfurous emissions. Claims 4 and 8 were also rejected under 35 U.S.C. § 103(a) as unpatentable over either the Boulos et al. reference in view of the Amrhein et al. reference, or EP 823,404 in view of the Amrhein et al. reference. The Examiner alleges that it would have been obvious to replace a portion of the Na_2SO_4 in the batches according to the Boulos et al. reference or EP 823,404 because the Amrhein et al. reference teaches that it is well known to replace a portion of the Na_2SO_4 in soda-lime glass batches with a nitrate in order to suppress sulfurous emissions. Applicants traverse the rejections as applied to claims 1, 3, and 4 and inasmuch as it applies to the newly added claims 9 and 10, for the reasons set forth below.

Claims 2 and 5-8 have been cancelled. Thus, the rejections directed to claims 2 and 5-8 are moot. Applicants have amended claims 1, 3, and 4 to overcome these rejections and distinguish it from each of the cited references. In addition, applicants offer the following to explain distinguishing features of the present application from each of these references.

Applicants would like to point out that amended claim 1 includes further limitations that distinguishes it from each of the cited references. Applicants would further like to point out that amended claim 3 includes a lower limit of 0.075% that is based on sample 16 of Table 5 (see page 11 of the specification). The Cheng et al., Penrod, and Higby et al. references disclose an infrared energy and ultraviolet radiation absorbing green-colored glass. The Cheng et al. reference teaches having suitable batch ingredients of a cerium containing compound (such as cerous carbonate, ceric oxide, etc.), titanium dioxide, a sulfate (such as salt cake or gypsum), an iron (such as Fe_2O_3 , iron oxalate, metallic iron, or the like), etc. (see column 6, line 57-

column 7, line 60; EXAMPLES 1-11; and claims 1-24). Both of the Penrod and Higby et al. references teach having suitable batch ingredients of SiO_2 , Na_2O , K_2O , MgO , CaO , Al_2O_3 , BaO , Fe_2O_3 , TiO_2 , a sulfate selected from the group consisting of salt cake and gypsum, etc. (the Penrod reference: see column 5, line 8-column 6, line 37; EXAMPLES 1-7; and claims 1 and 2; the Higby et al. reference: see column 5, line 6-column 6, line 37; EXAMPLES 1-7; and claims 1-4). EP 823,404 and the Boulos et al. reference disclose a method of preventing the formation of nickel sulfide stones in soda-lime-silica glass by adding 0.01-2.0 wt. % of an oxygen-containing manganese compound (preferably MnO_2) calculated as manganese dioxide, to batch materials. (the Boulos et al. reference: see column 2, line 8-column 6, line 40; EP 823,404: see page 3, line 1-page 5, line 55).

EP 823,404 and the Boulos et al., Cheng et al., Penrod, and Higby et al. references, however, do not teach having the claimed additives, an oxide of tin (Sn), cobalt (Co), lead (Pb), or lithium (Li), a chloride of Sn, iron (Fe), Co, Pb, or Li, a sulfate of Sn, Fe, Co, Pb, or Li, and a nitrate of Sn, Fe, Co, Pb, or Li, of claim 1 that are capable of effectively suppressing formation of nickel sulfide (NiS) according to the present invention.

The Amrhein et al. reference discloses a method of reducing sulfur-containing emissions from a large scale, continuous, flat glass melting operation. (see column 7, line 1-column 9, line 24). The Amrhein et al. reference also discloses that inorganic nitrate salt (e.g. NaNO_3) is used as an oxidizing agent, and a portion of Na_2SO_4 is replaced by NaNO_3 . The organic nitrate, however, is not used for suppressing formation of nickel sulfide (NiS) as the present invention. Thus, the Amrhein et al. reference neither discloses nor teaches the present invention.

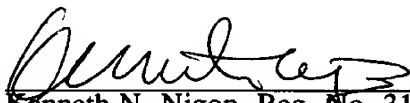
Therefore, reconsideration of the rejections of claims 1, 3, and 4 and their allowance are respectfully requested.

~~Since ref suppresses sulfur emissions, this will~~
~~Per the~~
~~Since ref suppresses sulfur emissions, therefore the nickel sulfide~~
~~The~~
 ↓ due to ↓ of sulfur emissions reacting w/nickel

Summary

In view of the foregoing amendments and remarks, applicants submit that this application is in condition for allowance and respectfully request early and favorable notification to that effect. If it would expedite prosecution of this application, the Examiner is invited to confer with applicants' undersigned attorneys.

Respectfully Submitted,


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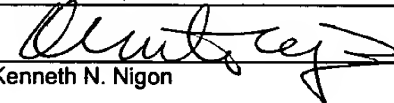
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Kenneth N. Nigon

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Specification at page 1, line 1:

~~Description~~

Specification at page 1, line 3:

~~Technical~~ Field of the Invention

Specification at page 1, line 10:

~~Background Art~~ of the Invention

Specification at page 3, line 12:

~~Disclosure~~ Summary of the Invention

Specification at page 3, line 26:

Detailed Description of the Invention

Specification at page 5, line 20:

~~Best Mode for Carrying Out the Invention~~ Examples

Specification at page 12, line 17:

~~Industrial Applicability~~

IN THE CLAIMS:

Please cancel claims 2 and 5-8.

- 1 1. (Amended) A raw material composition for soda-lime glass, comprising
2 a mirabilite (Na_2SO_4)-containing glass raw material having the incorporation of ~~to which~~
3 an additive selected from the group consisting of ~~containing~~ an oxide of tin (Sn), cobalt
4 (Co), lead (Pb), or lithium (Li), a chloride of Sn, iron (Fe), Co, Pb, or Li, a sulfate of
5 Sn, Fe, Co, Pb, or Li, or and a nitrate of a metal Sn, Fe, Co, Pb, or Li is incorporated.

1 3. (Amended) A raw material composition for soda-lime glass according to
2 claim-~~2~~ 1, wherein the percentage by weight of the additive is in the range
3 betweenfrom about 0.075% ~~or more and~~ to about 0.15% ~~or less~~ on the basis of the
4 total weight of the glass raw material.

1 4. (Amended) A raw material composition for soda-lime glass, comprising
2 a mirabilite (Na_2SO_4)-containing glass raw material ~~to which~~ having the incorporation
3 ~~an additive selected from the group consisting of sodium nitrate (NaNO_3), potassium~~
4 ~~nitrate (KNO_3), and of~~ lithium nitrate (LiNO_3) ~~is incorporated~~, wherein about 50% of
5 the amount of mirabilite (Na_2SO_4) contained in the glass raw material is replaced by the
6 additive the LiNO_3 .

1 9. (Newly Added) A raw material composition for soda-lime glass,
2 comprising a mirabilite (Na_2SO_4)-containing glass raw material having the
3 incorporation of an additive selected from the group consisting of tin oxide (SnO_2),
4 cobalt oxide (CoO), lead oxide (PbO), lithium nitrate (LiNO_3), $\text{Fe}(\text{NO}_3)_3 \cdot 9 \text{H}_2\text{O}$,
5 $\text{FeCl}_3 \cdot 6 \text{H}_2\text{O}$, and $\text{FeSO}_4 \cdot 7 \text{H}_2\text{O}$.

1 10. (Newly Added) A raw material composition for soda-lime glass
2 according to claim 1 or 4, further comprising at least one species selected from the
3 group consisting of ferric oxide (Fe_2O_3), selenium (Se), and cerium (Ce), as a coloring
4 component.